

Having determined goals, the problem is then how to implement them without creating a centrally planned economy and state. Recent upheavals in eastern Europe show the failings of that approach, not only in its ability to deliver basic goods and services to the community but also from an environmental point of view. Many of the worst environmental problems and unwanted adverse effects of growth and development are to be seen in centrally planned economies.

Dr Recher laments the general standard of environmental education and teaching in professional resource management institutions. He indicts them for their lack of capacity to instil a sense of humanity in students and the adoption of Leopold's land ethic. Such schools also lack an ability to relate to government departments. So often their teachings are conducted in an abstract or theoretical world and are not linked to political realities. The reality is that the community demands increasing lifestyles and greater use of resources and at the same time want environmental programmes and policies. Addressing this inherent conflict is difficult.

A strong case can be made for bringing these environmental education institutions closer to government and

to organizations such as the Bureau of Rural Resources in the Department of Primary Industries and Energy. The BRR has the role of filling the gap between the work of scientists and policy development. We are a group of animal, plant, land, forestry and fisheries scientists under one roof but in close contact with economic and policy divisions of the department.

In the Bureau the opportunity is present for university staff and others to be seconded either on sabbatical or to work as Bureau staff officers for short periods. By doing so they will be able to learn more of the government policy development process and to contribute to the task of:

- providing advice and scientific and technical information on rural resources, and
- reviewing, analysing and synthesizing it into advice for the management of government programmes.

Dr Recher has made a valuable contribution in this paper and the ensuing discussion on sustainable development. The task is to go on and analyze the problem and to find solutions that are both scientifically sound and economically and politically possible.

Comment on Wildlife conservation in Australia State of the Nation

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Harry Recher's keynote address to the ACIUCN Threatened Species Conference, 1-4 December, 1989 at Taronga Zoo, Sydney provides a pessimistic view of the status of wildlife conservation in Australia. While I would not argue with his basic thesis that Australian wildlife (both animals and plants) is declining in abundance and diversity I believe that providing a frightening scenario of the future will, on its own, not encourage people to believe that current problems are solvable. If we are to persuade politicians and the general public to the view that something can and should be done it is important to balance the pessimism with information on recent success stories and provide practical solutions. Prophecies of doom can readily become self-fulfilling.

As well, scientists need to be as factual as possible about the number of endangered species and the risks of extinction. Claims that large numbers of species will

become extinct in the near future will ultimately cause a backlash when the predictions don't come true.

Wildlife conservation, including the conservation of endangered species, has traditionally been a responsibility and function of the states, with the Commonwealth Government only recently taking an interest in the subject. Have the states made significant progress in recent years?

When I joined the Western Australian Public Service as a junior wildlife scientist 21 years ago there were less than one million hectares of national parks and nature reserves in the state, there were no marine parks, there were no accurate statistics on the degree to which species and ecosystems were threatened and not one endangered species was being adequately managed to ensure its survival. Now there are over 15 million hectares of national parks and nature reserves, two

marine parks have been declared and several more are imminent, good data on the status of vascular plants and vertebrate animals are available (e.g., Hopper *et al.* 1990) and many ecosystems and endangered species have been protected in reserves and/or are being managed to prevent their extinction (e.g., Burbidge *et al.* 1986; Sampson *et al.* 1990). Similar successes have been achieved in other states.

Twenty years ago the creation of a representative series of reserves in the forests of the south-west of Western Australia seemed a pipe dream — today such a system exists. Fifteen years ago there was no organized non-government conservation movement — today non-government conservation organizations have a powerful place in Australian politics and are at last becoming knowledgeable about the real wildlife conservation issues. Five years ago the idea of a national coordinated research programme aimed at controlling foxes was only dreamed about by a few scientists in my department — today we are on the verge of achieving that aim.

This dramatically changed situation has been brought about mainly because of the hard work and dedication of scientists, naturalists and bureaucrats from within government organizations and from those prepared to work with government on advisory committees, and because politicians have reacted to real data and public concerns. Government research and action on "umbrella" animal species like the Noisy Scrub-bird, Western Swamp Tortoise and Numbat, and more recently plant species such as Purdie's Donkey Orchid, have alerted the public to the problem and enabled broader conservation plans to be implemented. Reports such as those of the Conservation Through Reserves Committee in the 1970s have become milestones in practical nature conservation and are still setting the scene for further land reservation.

My views above on the reasons for past progress are in stark contrast to Recher's view that "... it is clear that government is poorly prepared to deal with environmental issues; government is cumbersome, lacks the necessary expertise and may too often lack the intellectual stamina required to deal with complex events. It will be up to the non-government movement to provide government with the ideas, information and timetables that government cannot provide for itself" (p. 10). If this view was correct we in Western Australia would have achieved little or nothing.

No one would claim that enough has been done but there has been considerable progress and the basics are in place for future consolidation and development. The challenge is to build on what has been achieved and be cautiously optimistic rather than totally pessimistic about our chances of conserving the vast majority of species

in Australia. What then still needs doing and how can it be achieved?

To discuss this issue I will take Recher's three points listed as "new directions" (Recher 1990, Pp. 8-10).

1. **Conservation by reservation is a limited option.** This attitude is counter-productive. More conservation reserves are required. Not all Australia's conservation reserves are "atypical, fail to sample most of the continent's biota, ... are too small and have ecologically unsound boundaries" (Recher 1990, p. 8). Only a proportion of species can be conserved within reserves, but in Australia the data suggest that the proportion can be relatively high. For example, the Fitzgerald River National Park contains 20% of the known vascular plant species in Western Australia and 42% of those occurring in the South West Botanical Province (CALM 1989) and the Prince Regent Nature Reserve harbours 60% of Kimberley mammals and 44% of Kimberley birds (Burbidge 1975; Fuller and Burbidge 1978). Additionally, it is clear that many species cannot be conserved in the wild except in conservation reserves — species that cannot exist in farmland or on degraded areas. The declaration of additional reserves can be achieved by the development of scientifically-based proposals for new parks and reserves such as those for the Nullabor Plain (McKenzie and Robinson 1987; McKenzie *et al.* 1989) and by lobbying for their creation. Recher is not against the need for more national parks (Recher 1990, p. 9) but seems to be using the argument that they are a limited option to promote his next point, i.e., **The concept of multiple-use parks — which imposes environmental guidelines and wildlife conservation/management on land already committed to other uses — merits consideration.** Many would support such a concept so long as land is not set aside for conservation until a "real" use is found for it. The creation of national parks is an available option in our society — the concept of multiple-use parks is still a concept. The suggestion that government departments should work together towards such an aim rather than promoting the industries they were set up to regulate will only work if governments direct that this happens.
2. **Conservation by legislation will need more thought and less emotion.** I agree that better legislation is needed. Specifically, both the states and the Commonwealth must pass endangered species legislation that over-rides development considerations if biodiversity is to be maintained. Only Victoria has legislation that seeks to conserve all species, while Western Australia has had effective endangered plants legislation for nearly a decade. Better legislation can only be achieved via the political process.

3. **Research and education.** I fully agree with Recher's statements that there is too little of both and that Australia's scientists do not participate sufficiently in the political process. Researchers and research funding agencies need to redirect their efforts to solving the problems of nature conservation. In the past far too high a proportion of research has been directed towards species and ecosystems that are not endangered and to research not aimed at providing conservation agencies with usable results. This can be achieved by the individual action of independent researchers and by lobbying for government action. More relevant information needs to be collected but it also needs to be disseminated to interested people and organizations. The creation of an endangered species network funded by the Commonwealth via the Endangered Species Programme is an important first step to achieve this aim.

I would add two major points to Recher's.

1. The nature conservation agencies must be adequately staffed and financed. This is essential if the active management that is needed for parks and reserves, ecosystems and species is to be carried out. Wildlife conservation won't be achieved solely by legislation, lobbying or education — the environment needs managing. Adequate resources for management agencies can be achieved by the conservation agencies and the non-government conservation movement working together and by the latter lobbying for more resources for the agencies rather than criticizing them on every available occasion.
2. We need more species recovery and management plans. Recher's long held view that emphasizing the conservation of individual species diverts attention and resources from understanding and correcting the causes of species decline and extinction (see Recher 1990, p. 5 for references) is, I believe, flawed. Studies into and management of the "charismatic mega-vertebrates" and the "pretty flowering plants" have provided the basis of our understanding of the processes behind extinctions in Australia and have been instrumental in educating the public about the problem. Studies on endangered mammals, for example, have led to pioneering studies on the use of fire in the management of habitat (Christensen and Maisey 1987), have provided the first experimental data proving that fox control is necessary to prevent further extinctions (Kinnear *et al.* 1989) and have given insights into the very different processes operating against Australian vertebrates compared to those in other parts of the world (Burbidge and McKenzie 1989). Diverting the meagre resources that are currently committed to species conservation to preventing land

degradation, for example, will not slow land degradation to a significant extent but will suggest to the public that we do not know how to save numbats, wallabies, bandicoots and orchids and have given up.

If we are not to emphasize the conservation of species which ones do we now sacrifice? I would submit that Australia can and should prevent the extinction of any further indigenous vertebrate animals and vascular plants. Doing this will conserve many other species and the ecosystems they inhabit.

Recher concluded his keynote address by suggesting that the future of the environment movement is in politics and exhorts NGOs to run for office as well as lobby governments. I would suggest that the future of nature conservation has always been in politics in the wider sense of the word. Scientists working for conservation agencies have known this for many decades. Everyone who wants to see effective wildlife conservation in Australia must recognize this fact and do something about it.

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Wildlife Conservation in Australia: Prophecies of Doom

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Am I a prophet of doom? Is there no hope for the future of Australia's wildlife?

The answer to both questions is no! In my paper on the State of the Nation (Recher 1990), I presented what I consider to be a view of wildlife conservation in Australia as it is in 1990 and made predictions of future events which are consistent with trends in the decline of the continent's biota over the 200 years of European settlement. If those views appear pessimistic or despairing as put by Andrew Burbidge and Steve Morton, then so be it. That is the way things are and that is the way they will be unless we significantly change the way we use and manage the nation's resources. Support of my position is given in the statements by Denis Saunders, John Pickard and Pat Hutchings. If anything, Hutchings and Pickard take me to task for ignoring vast areas of the continent requiring urgent attention by conservationists and land managers. The Minister of the Environment in New South Wales, Tim Moore, justifies my position when he states that I raised issues which "go beyond immediate and instinctive government policy" and that there is "a clear need [for government] to make commitments that go beyond the life span of single Parliaments or Governments". It is not that we lack the knowledge or skills to arrest the decline of Australia's flora and fauna, but we do lack the political resolve and national leadership to apply that knowledge and those skills.

The reality of wildlife conservation in Australia is explicit in Philip Reed's (this volume) comments on John Whitehouse's (1990) paper: in 200 years of European colonization the continent has experienced massive environmental degradation and the destruction continues.

As George Wilson points out, the message is getting through to the wider community. However, unlike Wilson and Burbidge I am not convinced that the issues are understood or that the need for urgent action to resolve global, as well as Australian, environmental problems has yet been appreciated by key leaders in government and industry. Nor do I have any evidence that the general public is aware of, or concerned about, environmental issues other than those, such as Greenhouse, which have a high media profile. And these, as evidenced by the persistent confusion between the Greenhouse Effect and the thinning of the Ozone Layer even by university students, are not understood! Too many conservationists suffer from the same myopia that afflicts many intellectuals — they never talk with real people. It is a risk that all well-educated and dedicated individuals take when they assume that their conversations with colleagues and friends represent the views of the silent majority. I can assure them they do not! The silent majority remains serenely oblivious and, probably, uncaring of local, national and global environmental problems.

The depth of this problem is illustrated by recent surveys of first year students at Macquarie University and the University of New England. Andrew Beattie, Professor of Biology at Macquarie, was concerned about the emphasis or lack of emphasis placed on the study of biology (including environmental issues) in school. He therefore asked his first year students whether or not they had been encouraged to study biology and whether or not they thought that they had sufficient background in biology to make wise decisions about important contemporary biological and environmental issues. I asked my students entering the courses of natural resource management and urban and regional planning at